

[SPECIFICATION]

[TITLE OF THE INVENTION]

STRUCTURE OF TUB COVER IN AUTOMATIC WASHING MACHINE

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[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a sectional view illustrating a structure of a tub cover in a general washing machine.

10 FIG. 2 is an enlarged view illustrating main parts of a tub cover in a general washing machine.

FIG. 3 is a sectional view illustrating a washing machine according to the present invention.

FIG. 4 is a disassembled perspective view illustrating lower and upper tub covers in a washing machine according to the first embodiment of the present invention.

15 FIG. 5 is an enlarged section view illustrating an operation of main parts in a washing machine according to the first embodiment of the present invention.

FIG. 6 is an enlarged sectional view illustrating an operation of main parts in a washing machine according to the first embodiment of the present invention.

20 FIG. 7 is a disassembled perspective view illustrating lower and upper tub covers in a washing machine according to the second embodiment of the present invention.

FIG. 8 is an enlarged section view illustrating an operation of main parts in a washing machine according to the second embodiment of the present invention.

FIG. 9 is an enlarged section view illustrating an operation of main parts in a

washing machine according to the second embodiment of the present invention.

FIG. 10 is a disassembled perspective view illustrating lower and upper tub covers in a washing machine according to the third embodiment of the present invention.

FIG. 11 is an enlarged section view illustrating an operation of main parts in a washing machine according to the third embodiment of the present invention.

Description of reference numerals for main parts in the drawings

101: washing machine	102: outer tub
103: inner tub	104: driving shaft
105: motor	111: upper tub cover
112: recess	113: upper guide slope surface
114: projection	115: passage
121: lower tub cover	122: lower guide slope surface
126: protecting barrier	131: supply hole

[DETAILED DESCRIPTION OF THE INVENTION]

[OBJECT OF THE INVENTION]

[FIELD OF THE INVENTION AND DISCUSSION OF THE RELATED ART]

The present invention relates to a washing machine, and more particularly, to a structure of a tub cover in an automatic washing machine, in which it is possible to prevent washing water being pumped between an inner tub and an outer tub and being provided to the inner tub from being scattered during a washing process, and to prevent the washing water from being collected in a recess of an upper tub cover.

FIG. 1 illustrates a related art pulsator washing machine.

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The related art washing machine includes an outer tub 2, an inner tub 3, a pulsator 4, a washing shaft 6, a spinning shaft 6-1, a clutch 7, a motor 8 and a drain valve 9. At this time, washing water is stored in the outer tub 2 of the washing machine 1, and the inner tub 2 is installed within the outer tub 2 for washing laundry. Then, the pulsator 4 is installed at a bottom of the inner tub 3, which is rotated in regular and reverse directions for applying mechanical rotation to the laundry. The washing shaft 6 is connected to the pulsator 4 for rotating the inner tub 3 in the regular and reverse directions. The clutch 7 is formed to couple or decouple the washing shaft 6 with the spinning shaft 6-1. The rotation power of the motor 8 is transmitted to the clutch, pulley and belt for driving the clutch 7. The drain valve 9 connected to the outer tub 2 is formed to discharge the washing water to the exterior.

The related art washing machine is operated as follows.

First, laundry is put in the inner tub 3 of the washing machine, and a user put a starting button, thereby providing the washing water. When the washing water is provided at a predetermined amount in the inner tub 3 and the outer tub 2, the supply of the washing water is stopped.

The washing process is performed by a rotation of a motor. That is, the washing shaft 6 is rotated in regular and reverse directions according to the rotation of the motor 8; so that the pulsator 4 connected to the washing shaft 6 is rotated in the regular and reverse directions, thereby washing the laundry.

On completing the washing process, a discharge process is started with opening the drain valve 9. If the drain valve 9 is opened, the washing water of the outer tub 2 is discharged. After discharging the washing water, a spinning process is started for discharging the washing water being together with the laundry in the inner tub 3.

The washing shaft 6 is connected to the spinning shaft 6-1, and the inner tub 3 and the pulsator 4 being integrally formed are rotated in one direction at a high speed, so that the washing water is discharged to the outer tub 2 through a plurality of washing holes 5, and is drained to the exterior through the drain valve 10.

5 As shown in FIG. 2, since the tub cover 11 connected to the outer tub 2 is fixed to the outer tub 2 by a plurality of screws 14, a gap is slightly formed between an upper portion of the outer tub 2 and a flange 12. Also, an inserting side 13 of the tub cover 11 does not perfectly adhere to the outer tub 2 due to the gap.

10 Accordingly, in the related art tub cover for the penetration type washing machine, leakage of spray of the washing water generates through the gap between the inserting side 13 and the outer tub 2.

If the washing machine 1 is installed indoors, the washing water may be flown out in the floor in a case of that the washing water is splashed out of the outer tub 2. Also, if the washing water leaks in the motor or the drain motor, damages of the devices
15 may generate, or a user may receive an electric shock.

[TECHNICAL TASKS TO BE ACHIEVED BY THE INVENTION]

Accordingly, the present invention is directed a tub cover in an automatic washing machine that substantially obviates one or more of the problems due to
20 limitations and disadvantages of the related art.

An object of the present invention is to provide a tub cover in an automatic washing machine, in which it is possible to prevent washing water being splashed from being collected in an upper tub cover, and to prevent washing water being collected in the upper tub cover from overflowing to the outside of an outer tub, thereby preventing

devices inside the washing machine from being damaged.

To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described, the washing water discharge means of the upper tub cover includes a plurality of projections formed in the upper tub cover so as to form a passage for flowing the washing water between the lower and upper tub covers; and an upper guide slope surface formed in the upper tub cover for providing the washing water being collected in the recess between the projections to the inner tub.

Also, the washing water being collected in a recess of the upper tub cover may be discharged to a supply hole formed in a protecting barrier through a discharge hole formed in an upper tub cover.

Also, the washing water discharge means does not include a recess in the upper tub cover, and an upper guide slope surface has a predetermined slope α , so that the washing water being splashed to the upper tub cover naturally flows to the inner tub along the upper guide slope surface.

[PREFERRED EMBODIMENTS OF THE INVENTION]

FIG. 3 to FIG. 11 illustrate a washing machine according to the present invention.

In the washing machine according to the present invention, it is possible to prevent washing water from being collected in a recess 112 of an upper tub cover 111, when the washing water is pumped between an inner tub 103 and an outer tub 102 according to a centrifugal force by a high speed rotation of the inner tub 103, and is provided to the inner tub 103, or the washing water is splashed in the inner tub 103

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during a washing process.

A washing water discharge means includes a plurality of projections 114, and an upper guide slope surface 113. The plurality of projections 114 are formed in the upper tub cover 111 for forming a passage 115 between the upper tub cover 111 and the lower tub cover 121. Also, the upper guide slope surface 113 is formed in the upper tub cover for flowing the washing water of the recess 112 between the projections 114 toward the inner tub 103.

Also, the washing water discharge means of the upper tub cover includes a plurality of discharge holes 125, a protecting barrier 123, and a supply hole 124. At this time, the plurality of discharge holes 125 are formed in the upper tub cover 111 for discharging the washing water being collected in the recess 112 of the upper tub cover 11 through the passage 115, and the protecting barrier 123 is formed in a lower guide slope surface 122 for distinguish the collected washing water for being discharged through the discharge hole 125 from the washing water flowing through the passage 115, and discharging the collected washing water. The supply hole 124 is formed in the protecting barrier 123 for providing the washing water being in the protecting barrier 123 to the inner tub 103.

In the washing water discharge means of the upper tub cover, the recess 112 may be not formed in the upper tub cover 111, and the upper guide slope surface 113 has a predetermined slope α , the washing water being splashed to the upper tub cover 111 naturally flows into the inner tub 103 along the upper guide slope surface.

An operation of the washing machine according to the present invention will be explained as follows.

FIG. 3 is a sectional view illustrating the washing machine according to the

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present invention. Referring to FIG. 3, laundry is put into the inner tub 103 of the washing machine 101, and a starting button is pressed so as to provide the washing water. When the washing water is provided in the inner and outer tubs 103 and 102 at a predetermined degree, the supply of the washing water is stopped. Then, a washing process is performed by rotations of a motor 105. That is, a driving shaft 104 is driven at regular and reverse directions according to the regular and reverse direction rotation of the motor 105, thereby rotating the inner tub 103 in the regular and reverse directions. Accordingly, the laundry is cleaned by the regular and reverse direction rotation of the inner tub 103.

10 At this time, the number of the rotation of the motor 105 has to be increased for performing a penetration washing. If the number of the rotation of the motor 105 increases, the number of the rotation of the inner tub 103 increases, thereby increasing a centrifugal force. Accordingly, the laundry is positioned on wall surfaces of the inner tub 103, and the washing water penetrates the texture of the laundry. At this time, the dirt of the laundry is cleaned since the washing water penetrates the texture of the laundry.

Then, the washing water penetrating the texture of the laundry is discharged to the outer tub 102 through a drain hole of the inner tub 103. That is, the washing water being discharged to the outer tub 102 rises upwardly along a space between the inner tub 103 and the outer tub 102 according to the centrifugal force of the high speed rotation of the inner tub 103.

The washing water rising between the inner tub 103 and the outer tub 102 is provided to a space between the lower tub cover 121 and the outer tub 102, and is provided to the inner tub 103 along the passage 115 between the lower tub cover 121

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and the upper tub cover 111.

FIG. 4 to FIG. 5 illustrate a washing machine according to the first embodiment of the present invention. As shown in the drawings, the washing water being pumped according to the centrifugal force and being provided to the inner tub 103 may be splashed, or the washing water may be splashed during the washing process, so that the washing water may be collected in the recess 112 of the upper tub cover 111.

However, the washing water being collected in the recess 112 of the upper tub cover 111 is guided to the inner tub 103 by the upper guide slope surface 113 formed in the upper tub cover 111, as shown in FIG. 5, thereby preventing the washing water from overflowing to the outside of the outer tub 102.

Also, the washing water being pumped between the inner tub 103 and the outer tub 102 is provided to the inner tub 103 along the passage 115 formed by the projection 114 of the upper tub cover 111, as shown in FIG. 6, thereby smoothly circulating the washing water during the washing process.

FIG. 7 to FIG. 9 illustrate a washing machine according to the second embodiment of the present invention. As shown in the drawings, the washing water being collected in the recess 112 of the upper tub cover 111 is provided inside the protecting barrier 123 formed in the lower tub cover 121 through the plurality of discharge holes 125 formed in the upper tub cover 111. Then, the washing water being in the protecting barrier 123 is provided to the inner tub 103 through the supply hole 124, as shown in FIG. 9, so that it is possible to prevent the washing water from overflowing to the outside of the outer tub 102.

Also, the washing water being pumped between the inner tub 103 and the outer tub 102 is provided to the inner tub 103 along the passage 115 formed between the

protecting barriers 123 of the upper tub cover 111, as shown in FIG. 8, thereby smoothly circulating the washing water.

FIG. 10 and FIG. 11 illustrate a washing machine according to the third embodiment of the present invention. In the washing machine according to the third embodiment of the present invention, the recess 112 is not formed in the upper tub cover 111, and the upper guide slope surface 113 has a predetermined slope α , so that the washing water being splashed to the upper tub cover 111 naturally flows to the inner tub 103 along the upper guide slope surface 113, as shown in FIG. 11.

10 [ADVANTAGES OF THE INVENTION]

The washing machine according to the present invention has the following advantages.

The upper guide slope surface is formed for flowing the washing water being collected in the recess of the upper tub cover toward the inner tub, and the plurality of
15 projections including the passage is formed for providing the washing water being pumped to the inner tub.

The washing water being collected in the recess of the upper tub cover is discharged to the supply hole formed in the protecting barrier through the discharge hole formed in the upper tub cover.

20 Or, the recess of the upper tub cover is not formed, and the upper tub cover has a predetermined slope, so that the washing water naturally flows into the inner tub.

Accordingly, it is possible to prevent the washing water being splashed from being collected in the upper tub cover during the penetration washing process, simultaneously, to prevent the washing water being collected in the upper tub cover

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from overflowing to the outside of the outer tub, thereby preventing devices inside the washing machine from being damaged.

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